



Prevalence of human pathogens and indicators in stormwater runoff in Brisbane, Australia

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Abstract:

Elevated numbers of enteric pathogens in the receiving waters following a storm event can be a serious public health concern. The purpose of this study was to conduct a preliminary investigation into the presence of human pathogens of concern in urban stormwater runoff. The involvement of a human sewage as a potential source of contamination was also investigated by using microbial source tracking methods. Water samples (20 L) were collected after storm events and during the dry weather from six sites in Brisbane, Australia. Collected samples were analyzed for fecal indicator bacteria (FIB), and then concentrated using hollow fiber ultrafiltration followed by molecular detection of selected enteric pathogens. The levels of FIB were found to frequently exceed the upper limit of Australian guidelines for managing risks in recreational water, during the dry periods and by further several orders of magnitude in the stormwater runoff. Enterococcus spp. numbers as high as 3×10^4 100 mL⁻¹ were detected in the stormwater runoff at the Fitzgibbon site. Human adenovirus and polyomavirus were frequently detected from all six sampling sites during wet and dry weather conditions suggesting their wide spread presence in the urban aquatic environments. Campylobacter jejuni, Campylobacter coli and Salmonella enterica were also detected during both dry and wet weather conditions. Presence of human-specific HF183 Bacteroides marker in most of the samples tested suggests ubiquitous sewage contamination in the urban environment. Since stormwater runoff routinely contains high numbers of FIB and other enteric pathogens, some degree of treatment of captured stormwater would be required if it were to be used for non-potable purposes.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Pathogen

Geographic Feature:

resource focuses on specific type of geography

Freshwater, Urban

Geographic Location:

Climate Change and Human Health Literature Portal



resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Campylobacteriosis, Salmonellosis

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified